

AIR CONDITIONER

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to an air conditioner, particularly to one provided with a return-wind box having at least one wind outlet. A return-wind faceplate is assembled at the lower side of the return-wind box, having at least one return-wind inlet. At least one evaporator is provided on the return-wind faceplate to face the wind outlet of the return-wind box. At least one wind exhausting faceplate is connected with the return-wind box by a wind duct, having wind exhausting openings, with a cold wind chamber assembled above the wind exhausting openings and having a wind inlet connected with the wind outlet of the return-wind box by a wind duct. At least one motor fan is assembled with the wind exhausting faceplate. Thus, air in a room gets into the return-wind box through the return-wind faceplate to be condensed into cold air by the evaporator. Then, the cold air is sent to the wind exhausting faceplate through the wind outlet of the return-wind box and forcefully blown outward by the motor fan to get in a room through the wind exhausting openings to enable the cold air to circulate quickly in a room, having excellent effect of evenly cooling a room and able to economize energy source.

2. Description of the Prior Art

A conventional air conditioning system installed on the floor of an upper storey has a wind exhausting faceplate provided close to and connected with an indoor engine by a wind duct, so that cold air can be sent out through the wind outlets of the wind exhausting faceplate. As the wind guiding plates of the wind outlets are fixedly formed integral, cold air

around the wind outlets is stronger than that far from them, unable to cool a room evenly. Therefore, a plurality of wind exhausting faceplates have to be provided at different locations on a ceiling and connected by comparatively long wind ducts. Under this condition, cold air conveyed 5 through different-length wind ducts cannot evenly maintain its original cold temperature, failing to supply a room with even cold air.

SUMMARY OF THE INVENTION

The objective of the invention is to offer an air conditioner able to let cold air circulate quickly in a room and having excellent effect of evenly 10 cooling a room.

A first feature of the invention is a return-wind box provided with at least one wind outlet. A return-wind faceplate is assembled at the lower side of the return-wind box, having at least one return-wind inlet. At least one evaporator is installed on the return-wind faceplate. At least one wind 15 exhausting faceplate is connected with the return-wind box by a wind duct, having wind exhausting openings, with a cold wind chamber assembled above the wind exhausting openings and having a wind inlet connected with the wind outlet of the return-wind box by a wind duct. At least one motor fan is assembled with the wind exhausting faceplate.

20 A second feature of the invention is a return-wind box provided with at least one wind outlet. A return-wind faceplate is assembled at the lower side of the return wind box, having at least one return-wind inlet. At least one evaporator is assembled on the return-wind faceplate. At least one wind exhausting faceplate is connected with the return-wind box by a wind duct, having wind exhausting openings, with a cold wind chamber 25 assembled above the wind exhausting openings and having a wind inlet connected with the wind outlet of the return-wind box. At least one motor

fan is assembled on the return-wind faceplate.

A third feature of the invention is a return-wind box provided with at least a wind outlet. At least one evaporator is installed in the return-wind box to face the wind outlet of the return-wind box. A faceplate is 5 assembled at the lower side of the return wind box, having a return-wind inlet and at least one wind exhausting opening, with cold wind chamber positioned above the wind exhausting opening and having a wind inlet communicating with the wind outlet of the return-wind box. At least one motor fan is installed in the cold wind chamber to face the wind exhausting 10 opening of the faceplate.

BRIEF DESCRIPTION OF DRAWINGS

This invention will be better understood by referring to the accompanying drawings, wherein:

Fig. 1 is an exploded perspective view of a first preferred 15 embodiment of an air conditioner in the present invention;

Fig. 2 is a cross-sectional view of the first preferred embodiment of an air conditioner in the present invention;

Fig. 3 is a cross-sectional view of a second preferred embodiment of an air conditioner in the present invention;

20 Fig. 4A is a cross-sectional view of a third preferred embodiment of an air conditioner in the present invention;

Fig. 4B is another cross-sectional view of the third preferred embodiment of an air conditioner in the present invention;

Fig. 5 is a third cross-sectional view of the third preferred 25 embodiment of an air conditioner in the present invention;

Fig. 6 is a cross-sectional view of a fourth preferred embodiment of an air conditioner in the present invention;

Fig. 7 is a cross-sectional view of a fifth preferred embodiment of an air conditioner in the present invention; and,

Fig. 8 is a cross-sectional view of a sixth preferred embodiment of an air conditioner in the present invention.

5 DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

A first preferred embodiment of an air conditioner in the present invention, as shown in Figs. 1 and 2, includes a return-wind box 1, a return-wind faceplate 2, at least one evaporator 3, at least one wind exhausting faceplate 4 and at least one motor fan 5 combined together.

10 The return-wind box 1 is provided with at least one wind outlet 10 for fitting a wind duct 6, and has its front and rear side respectively provided with plural positioning members 11 to be screwed with bolts 7 secured on an upper floor so as to fix the return-wind box thereon.

The return-wind faceplate 2 assembled with the return wind box 1
15 is formed with a return wind-inlet 20 having a filter screen 200 provided therein.

The evaporator 3 installed in the return-wind box 1 is provided with a moisture-collecting tray 30 at the bottom.

The wind exhausting faceplate 4 is connected with the wind outlet
20 10 of the return-wind box 1 by a wind duct 6, having wind exhausting openings 40. A cold wind chamber 41 is positioned above the wind exhausting openings 40, having a wind inlet 410 connected with one end of a wind duct 6, which has the other end fitted with the wind outlet 10 of the return-wind box 1. The cold wind chamber 41 has one side provided
25 with plural positioning members 411 to be screwed with bolts 7 secured on an upper floor so as to fix the cold wind chamber 41 thereon.

The motor fan 5 is installed in the cold wind chamber 41 of the

wind exhausting faceplate 4 to forcefully blow cold air outward through the wind exhausting openings 40 of the wind exhausting faceplate 4.

Thus, air in a room passes through the return-wind faceplate 2 and, after filtered, gets into the return-wind box 1 to be condensed into cold air by the evaporator 3. Subsequently, the cold air is sent to the wind exhausting faceplate 4 through the wind outlet 10 of the return-wind box 1 and then forcefully blown outward by the motor fan 5 to let the cold air circulate quickly in a room, having excellent effect of cooling a room evenly and able to economize energy source.

10 A second preferred embodiment of an air conditioner in the present invention, as shown in Fig. 3, includes a return-wind box 1, a return-wind faceplate 2, at least one evaporator 3, at least one wind exhausting faceplate 4 and at least one motor fan 6 combined together.

15 The return-wind box 1 is provided with at least one wind outlet 10 for fitting a wind duct 6. The return-wind box 1 has its front and rear wall respectively provided with plural positioning members 11 to be screwed with bolts 7 secured on an upper floor so as to fix the return-wind box 1 thereon.

20 The return wind faceplate 2 assembled with the return-wind box 1 is provided with a return-wind inlet 20 having a filter screen 200 provided therein.

The evaporator 3 installed in the return-wind box 1 is provided with a moisture-collecting tray 30 at the bottom.

25 The wind exhausting faceplate 4 is connected with the outlet 10 of the return-wind box 1 by a wind duct 6, having wind exhausting openings 40. A cold wind chamber 41 is positioned above the wind exhausting openings 40, having a wind inlet 410 connected with one end of a wind duct 6, which has the other end fitted with the wind outlet 10 of the return-

wind box 1. The cold wind chamber 41 has one side fixed with plural positioning members 411 to be screwed with bolts 7 secured on an upper flood so as to fix the cold wind chamber 41 thereon.

The motor fan 5 is installed in the return-wind box 1.

5 Thus, air in a room is forcefully sucked into the return-wind box 1 by the motor fan 5 and condensed into cold air by the evaporator 3. Subsequently, the cold air is sent to the wind exhausting faceplate 4 through the wind outlet 10 of the return-wind box 1 and then blown outward through the wind exhausting openings 40, enabling cold air to
10 circulate quickly in a room and able to economize energy source.

A third preferred embodiment of an air conditioner in the present invention, as shown in Figs. 4A, 4B and 5, includes a return-wind box 1, at least one evaporator 3, a faceplate 8 and at least one motor fan 5 combined together.

15 The return-wind box 1 is provided with at least one wind outlet 10 for fitting a wind duct 6. The return-wind box 1 has its front and rear side respectively fixed with plural positioning members 11 to be screwed with bolts 7 secured on an upper floor so as to fix the return-wind box 1 thereon.

20 The evaporator 3 installed in the return-wind box 1 is provided with a moisture-collecting tray 30 at the bottom.

The faceplate 8 assembled with the return-wind box 1 is provided with a return-wind inlet 80 and at least one wind exhausting opening 81, with the return-wind inlet 80 provided therein with a filter screen 800. A
25 cold wind chamber 82 is positioned above the wind exhausting opening 81, having a wind inlet 820 connected with the wind outlet 10 of the return-wind box 1 by a wind duct 6. The cold wind chamber 82 has one side provided with plural positioning members 821 to be screwed with bolts 7

secured on an upper floor so as to fix the cold wind chamber 82 thereon.

The motor fan 5 is installed in the cold wind chamber 82 of the faceplate 8 to forcefully blow cold air outward through the wind exhausting opening 81.

5 Thus, air in a room passes through the return-wind inlet 80 of the faceplate 8 and, after filtered, gets into the return-wind box 1 to be condensed into cold air by the evaporator 3. Subsequently, the cold air is sent into the cold wind chamber 82 through the wind outlet 10 of the return-wind box 1 and then forcefully blown outward through the wind
10 exhausting opening 81 by the motor fan 5, enabling the cold air to circulate quickly in the room and able to save energy source.

In addition, in the third preferred embodiment of an air conditioner, one of the wind outlets 10 of the return-wind box 1 is connected with the wind inlet 820 of the cold wind chamber 82 by the wind duct 6 and the
15 other wind outlet 10 can be connected with other wind exhausting faceplates 4 by another wind duct 6 to match with practical demands in an indoor space design, able to cool a room evenly and quickly.

Further, the third preferred embodiment of an air conditioner can be assembled in another style shown in Fig. 4B. The faceplate 8 is
20 provided with a return-wind inlet 80 and a wind exhausting opening 81, and a cold wind chamber 82 positioned above the wind exhausting opening 81 is hung on the outer side of the wind outlet 10 of the return-wind box 1, with the wind inlet 820 of the cold wind chamber 82 aligned to the wind outlet 10 of the return-wind box 1, able to form various ways of
25 wind returning and wind exhausting and match with different faceplates.

Furthermore, the third preferred embodiment of an air conditioner can also be assembled in a style shown in Fig. 5. The faceplate 8 assembled at the lower side of the return-wind box 1 is provided with a

return-wind inlet 80, and other wind exhausting faceplate 4 can be hung on the outer side of the wind outlet 10 of the return-wind box 1 to face the wind outlet 10, able to form various assembly styles.

A fourth preferred embodiment of an air conditioner in the present
5 invention, as shown in Fig. 6, includes a return-wind box 1, a return-wind
faceplate 2, at least one evaporator 3, at least one wind exhausting
faceplate 4 and at least one housing 9 combined together.

The return-wind box 1 is provided with at least one wind outlet 10
for fitting a wind duct 6. The return-wind box 1 has its front and rear side
10 respectively provided with plural positioning members 11 to be screwed
with bolts secured on an upper floor so as to fix the return-wind box 1
thereon.

The return-wind faceplate 2 assembled with the return-wind box 1
is provided with a return-wind inlet 20, having a filter screen provided
15 therein.

The evaporator 3 installed in the return-wind box 1 is provided with
a moisture-collecting tray 30 at the bottom

The wind exhausting faceplate 4 sends out cold air condensed by
the evaporator 3 in the return-wind box 1, having wind exhausting
20 openings 40. A cold wind chamber 41 is positioned above the wind
exhausting openings 40, having a wind inlet 410 connected with the wind
outlet 10 of the return-wind box 1 and plural positioning members 411 on
the opposite sides to be screwed with bolts secured on an upper floor so
as to fix the cold wind chamber thereon.

25 The two housings 9 respectively receiving a motor fan 5 therein
are respectively connected with the return-wind box 1 and the wind
exhausting faceplate 4 by wind ducts 6. Each housing 9 has its front and
rear side respectively bored with a through hole 90 for fitting the wind duct

6 and its opposite upper sides respectively provided with plural positioning members 91 to be screwed with bolts 7 secured on an upper floor so as to fix the housing 9 thereon.

Thus, air in a room passes through the return-wind faceplate 2 and, 5 after filtered, gets into the return-wind box 1 to be condensed into cold air by the evaporator 3. Subsequently, the cold air is sent out through the wind outlet 10 of the return-wind box 1 and then forcefully blown outward through the wind exhausting openings 40 of the wind exhausting faceplate 4 by the motor fan 5, enabling the cold air to circulate quickly in a room, 10 able to save energy source and having excellent effect of shock absorption as well as cooling a room evenly.

A fifth preferred embodiment of an air conditioner in the present invention, as shown in Fig. 7, includes a return-wind box 1, a return-wind faceplate 2, at least one evaporator 3, at least one wind exhausting faceplate 4 and at least one housing 9 combined together.

The return-wind box 1 is provided with at least one wind outlet 10 for fitting a wind duct 6 and has its front and rear side respectively provided with plural positioning members 11 to be screwed with bolts 7 secured on an upper floor so as to fix the return-wind box 1 thereon.

20 The return-wind faceplate 2 assembled with the return-wind box 1 is provided with a return-wind inlet 20 having a filter screen provided therein.

The evaporator 3 installed in the return-wind box 1 is provided with a moisture-collecting tray 30 at the bottom.

25 The wind exhausting faceplate 4 sends out cold air condensed by the evaporator 3, having wind exhausting openings 40. A cold wind chamber 41 is positioned above the wind exhausting openings 40, having a wind inlet 410 and having one side provided with plural positioning

members 411 to be screwed with bolts 7 secured on an upper floor so as to fix the cold wind chamber 41 thereon.

The housing 9 receiving a motor fan therein is hung on the outer side of the wind inlet 410 of the cold wind chamber 41. The housing 9 has 5 its left and right side respectively bored with a through hole 90, with the left through hole 90 aligned to the wind inlet 410 of the cold wind chamber 41 and the right one connected with the wind outlet 10 of the return-wind box 1 by a wind duct 6. Further, the housing 9 has one side provided with plural positioning members 91 to be screwed with bolts 7 secured on an 10 upper floor so as to fix the housing 9 thereon.

Thus, air in a room passes through the return-wind faceplate 2 and, after filtered, gets into the return-wind box 1 to be condensed into cold air by the evaporator 3. Subsequently, the cold air is sent into the cold wind chamber 41 through the wind outlet 10 of the return-wind box 1 and then 15 forcefully blown outward through the wind exhausting openings 40 of the wind exhausting faceplate 4 by the motor fan 5, letting the cold air circulate quickly in a room, able to economize energy source and having effect of cooling a room evenly.

A sixth preferred embodiment of an air conditioner in the present 20 invention, as shown in Fig. 8, includes a return-wind box 1, a return-wind faceplate 2, at least one evaporator 3, at least one wind exhausting faceplate 4 and at least one motor fan 5 combined together.

The return-wind box 1 is provided with at least one wind outlet 10 and has its front and rear side respectively provided with plural positioning 25 members 11 to be screwed with bolts 7 secured on an upper floor so as to fix the return-wind box 1 thereon.

The return-wind faceplate 2 assembled with the return-wind box 1 is provided with a return-wind inlet 20 having a filter screen provided

therein.

The evaporator 3 is installed in the housing 9, which is hung on the outer side of the wind outlet 10 of the return-wind box 1. The evaporator 3 is provided with a moisture collecting tray 30 at the bottom, and the 5 housing 9 has its opposite sides respectively bored with a through hole 90 for fitting a wind duct 6 and also has one side provided with plural positioning members 91 to be screwed with bolts 7 secured on an upper floor so as to fix the housing 9 thereon.

The wind exhausting faceplate 4 is connected with the through 10 hole 90 of the housing 9 by a wind duct 6, having wind exhausting openings 40. A cold wind chamber 41 is positioned above the wind exhausting openings 40, having a wind inlet 410 for fitting one end of the wind duct 6, which has the other end fitted with the wind outlet 10 of the return-wind box 1. The cold wind chamber 41 has its opposite sides 15 respectively provided with plural positioning members 411 to be screwed with bolts secured on an upper floor so as to fix the cold wind chamber 41 thereon.

At least one motor fan 5 is installed in the return-wind box 1.

Thus, air in a room is forcefully sucked into the return-wind box 1 20 by the motor fan 5 and condensed into cold air by the evaporator 3. Subsequently, the cold air is sent to the wind exhausting faceplate 4 through the wind outlet 10 of the return-wind box 1 and then blown outward through the wind exhausting openings 40. The number of the 25 evaporators 3 can be increased or decreased according to the size of an indoor space in order to let cold air circulate quickly in a room, able to save energy source and having excellent effect of cooling room evenly.

While the preferred embodiments of the invention have been described above, it will be recognized and understood that various

modifications may be made therein and the appended claims are intended to cover all such modifications that may fall within the spirit and scope of the invention.

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